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AUTHOR O'Donnell, Roy C.
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ABSTRACT

This study reflects the author's efforts to synthesize ideas drawn from various linguistic theorists, especially Schlesinger, Chomsky, and Fillmore. The first section gives the theoretical background for the study. The second section discusses roles, relations, and constructs. The final section discusses the applications of the study to teaching and research. In this study, a distinction is made between those semantic constructs encoding events and those encoding states. In the model presented, the basal component of the grammar generates constructs which consist of a modality index and a proposition. The proposition consists of related basal constituents and their respective semantic roles. The operative component assigns grammatical functions to basals, categorizes them as nouns, verbs, etc., supplies syntactic features and functions, and determines the sequential order of elements in overt sentences. The expressive component contains phonological elements and rules. (Author/TS)

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SEMANTIC ROLES, RELATIONS, AND CONSTRUCTS: THEO... AND APPLICATIONS

by

Roy C. O'Donnell

Studies in Language Education, Report No. 18
Department of Language Education, The University of Georgia
Athens, Georgia

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PREFACE

The material contained herein is a revision and expansion of Roles and Relations in Language Deep Structure, Studies in Language Education, Report No. 9, March 1974.

That report represented the author's attempt to synthesize his own ideas with ideas drawn from Chomsky and Fillmore. It was obviously a fragmentary treatment of semantic roles and relations in language structure. The present study reflects the author's further efforts to synthesize ideas drawn from various theorists. It has been especially influenced by the work of Schlesinger and Chafe. It also incorporates additional ideas from the work of Fillmore.

In this study, a distinction is made between semantic constructs encoding events and those encoding states. In this revised model, the basal component of the grammar generates constructs, which consist of a modality index and a proposition. The proposition consists of related basal constituents and their respective semantic roles. The operative component assigns grammatical functions to basals, categorizes them as nouns, verbs, etc., supplies syntactic features and functors, and determines the sequential order of elements in overt sentences. The expressive component contains phonological (or graphic) elements and rules.

The revisions assume the primacy of semantic structure in language, as did the earlier version. It seems unnecessary to call attention to the fact that this version, like the earlier one, is highly tentative and fragmentary.

Part I

THEORETICAL BACKGROUND

The theory of transformational-generative grammar formulated by Chomsky (1957) emphasized the primacy of syntax in linguistics. This theory was subsequently modified and revised by Chomsky himself and others, and alternative theoretical concepts have been proposed. In the present essay, suggestions are offered for further modification, revision, and synthesis of certain aspects of linguistic theory.

The modified theory stated by Chomsky (1965) maintains the emphasis on syntax. It elaborates the distinction between deep structure and surface structure of language and clearly distinguishes the syntactic component from the semantic and phonological components. The syntactic component is divided into base and transformational subcomponents, and the base is further divided into a categorial subcomponent and a lexicon. The semantic and phonological components are regarded as "purely interpretive." Deep structures, which are generated by the base of the syntactic component, enter the semantic component and receive semantic interpretations. Transformational rules serve to map deep structures into surface structures, which are given phonetic interpretation by the phonological rules.

Further revision and extension of generative-transformational theory resulted from the attempt by Lakoff (1970) to explain exceptions to syntactic regularity. Lakoff's proposed mechanism for exceptions led to questioning of the distinction Chomsky had made between syntax and semantics and of the concept of a deep structure distinct from semantic representation. The form of grammar resulting from Lakoff's investigation replaces Chomsky's categorial subcomponent and lexicon with two systems of generative rules.

One of these systems defines the class of possible semantic representations, and the other restricts the class of possible surface structures.

In his prefatory comments, Lakoff enumerates some implications of his proposed exception mechanism. He thinks it would:

> (1) allow certain sentences to be derived from underlying structures that more closely reflected their semantic representations; (2) permit one to reformulate transformational rules by removing idiosyncratic restrictions, thus permitting transformations in one language to resemble more closely transformations in other languages; and (3) permit the base rules to be simplified, seemingly in the direction of providing universal base rules (p. ix).

These implications are obviously related to the quest for linguistic universals, a quest which was furthered by Fillmore (1968) in his statements concerning an underlying set of "caselike relations" that determine syntactic and semantic relations in all natural languages.

Fillmore briefly reviews the recent history of speculation on language universals. He recognizes the distinction between syntactic relations and sequential order of constituents and says: "A common assumption is that the universal base specifies the needed syntactic relations, but the assignment of sequential order to the constituents of base structures is language specific" (p. 1). Allusion is made to the appeals for sequence-free representations of universal deep structure that have been made by Halliday (1966) and Tesnière (1959).

Fillmore argues convincingly that the grammatical notion case deserves a place in the base component of the grammar of every language. He calls for "a conception of base structure in which case relationships are primitive terms of the theory and in which such concepts as 'subject' and 'direct object' are missing" (pp. 2-3).

The modification of linguistic theory proposed by Fillmore includes the conceptual framework interpretation of case systems, with a clear

distinction between deep and surface structure. In his view the base structure of the sentence consists of a verb and one or more noun phrases, and each noun phrase in the base structure is associated with the verb in a particular case relationship. He suggests two major constituents of base structure: modality and proposition. Modality includes negation, tense, mood, and aspect. Proposition is "a tenseless set of relationships involving verbs and nouns (and embedded sentences, if there are any)" p. 23. Fillmore identifies six case notions: agentive, instrumental, dative, factitive, locative, and objective; and he recognizes the need for additional cases, such as benefactive, comitative, and temporal.

According to Fillmore: "The case notions comprise a set of universal, presumably innate, concepts which identify certain types of judgments human beings are capable of making about the events that are going on around them, judgments about such matters as who did it, who it happened to, and what got changed" (p. 24).

The analysis of semantic structure formulated by Chafe (1970) was influenced by Fillmore's theory of case relationships. Chafe takes the position that a sentence is built around a predicative element (semantic verb), which is usually accompanied by one or more nominal elements (semantic nouns). These elements are reflected typically in surface verbs and nouns. He assumes that the human conceptual universe is dichotomized initially into the two major areas represented by these two kinds of elements. The area of the verb embraces states and events; the area of the noun embraces things. Since the verb determines what the rest of the sentence is like, the verb is assumed to be central and the noun peripheral.

Chafe attempts to account for certain basic differences between the semantic structures of selected illustrative sentences. In sentences such

as "The wood is dry" and "The rope is tight" a noun (wood, rope) is said to be in a certain state or condition (dry, tight). The verb is specified as a state and it is accompanied by a noun which is its patient. Sentences such as "The wood dried," "Michael ran," and "Michael dried the wood" contain verbs which are not specified as states. A nonstate is an event, which can be distinguished from a state in that it answers the question What happened? Nonstate verbs are not all alike: Some deal with processes, some with actions, and some with both processes and actions. In a process a patient noun changes its state or condition. Action verbs express something someone does, and the agent noun specifies the performer of action. In sentences such as "Michael dried the wood" the verb is both a process and an action. As a process it involves a change in the condition of a patient noun; as an action it expresses what the agent noun does. With the exception of ambient sentences (It's late, It's raining), every sentence contains a patient noun or an agent noun or both.

In addition to the noun-verb relations of patient and agent, Chafe suggests the following relations: experiencer (Tom wanted a drink), beneficiary (Mary gave Tom the tickets), instrument (Tom cut the rope with a knife), complement (Tom ran a race), and location (The knife is in the box). Commenting on these seven relations, which are not necessarily all that exist, Chafe says:

> Six of these relations--all but instrument--are determined by the presence within the verb of a certain selectional unit. A state or process dictates the presence of a patient noun. An action verb dictates an agent noun. An experiential verb calls for an experiencer, a benefactive verb a beneficiary, a completable verb a complement, and a locative verb a location. An instrument noun depends basically on the presence of an action-process verb, although such a verb does not require the accompaniment of an instrument" (p. 164).

Schlesinger (1971), in an attempt to account for the structure of

child language, formulated a model of sentence production and comprehension. Although this model is not a grammar per se, it has more in common with Chafe's system than with Chomsky's. According to Schlesinger, psychological generation of a sentence does not begin with anything corresponding directly to the symbol S. It begins rather with the speaker's intention to express something. Thus, the germ of the sentence is the part of the speaker's intention which he means to express in words. Schlesinger's preverbal representation is an input (I) marker as contrasted with Chomsky's phrase (P) marker. I markers become sentences by means of realization rules. These realization rules determine sequential position and grammatical category of each element in the I marker. Hierarchical structure in sentences can be accounted for by the ordered application of two or more position rules, and transformations of order can be managed by making realization rules conditional.

The I marker for "John catches the red ball" includes the conceptions indicated by John, catch, red, and ball. It also includes the attributive relation of red to ball, the object relation of the red ball to catches, and the agent relation of John to catches the red ball. In Schlesinger's view, the I markers of sentences, concepts, and relations are determined by cognitive capacity. They are presumed to be universal and innate, but not specifically linguistic nor peculiarly human.

Schlesinger's model was designed to deal specifically with utterances in child language. In the two-word utterances he examined, he found the following relations expressed: agent and action (Mail come), action and object (See sock), agent and object (Eve lunch), modifier and head (Pretty boat), negation and X (No wash), X and dative (Throw daddy), introducer and X (See boy), and X and locative (Baby highchair).

Part II

ROLES, RELATIONS, AND CONSTRUCTS

In the present essay, the proposed modifications of linguistic theory have been influenced by Schlesinger's model, as well as Chafe's and Fillmore's. The attempt is made to bring together what appear to be valid concepts from various theorists. Chomsky's distinction between deep and surface structure is assumed to be valid in principle, but his syntactic, semantic, and phonological components are rearranged. Chafe's view of semantic structure is assumed to be essentially correct, but certain changes both in terminology and concepts are proposed. Fillmore's exclusion of subject, direct object, etc. from the base structure is approved, and it is further proposed that syntactic categories (noun, verb, etc.) be also excluded from the base. The need for specifying an underlying set of caselike relations is recognized, and this need is met by specifying semantic units called roles.

The rationale for specifying roles is related to the fundamental concept of structure. In brief, a structure consists of parts in relation to one another; the relation is defined by the roles of the parts. For example, the family is a structured entity composed of individuals, and each individual has a role which defines his relation to others in the family. A man has the role of father, a woman the role of mother, a boy the role of son, and a girl the role of daughter. But within the structure of the family there are substructures. In the conjugal relationship the man has the role of husband, and the woman has the role of wife. In the sibling relationship the boy has the role of brother, and the girl has the role of sister. The relationships of individuals to one another are defined by the

roles of the individuals, and the same individuals take different roles in different relationships.

The analogy of family structure with language structure is not perfect, of course, but it does illustrate the need for role identification in specifying relations of constituent parts. Since role is basic to the concept of relation, it follows that role identification is necessary for precision in describing the relations of elements in semantic structures. Since the concept of role can be applied to entities underlying verbs as well as nouns, analysis based on role identification is potentially more exact than analysis based on case relations. Thus the explanatory efficacy of a theory of semantic relations can be enhanced by recognizing roles as semantic units. The importance of caselike relations is not diminished, but these relations are precisely defined by specifying the roles of basal constituents.

The input for linguistic encoding is identified at the perceptual level. Perceived events and states are encoded at the basal linguistic level as structured entities which may be referred to as constructs. The output at the overt level, after appropriate syntactic and phonological elements are supplied, is the structured linguistic entity called the sentence. Language is thus viewed as being divided, for purposes of discussion, into three components: a basal component, an operative component, and an expressive component.

The basal component generates constructs, which consist of a modality index and a proposition. The modality index distinguishes assertions from queries, requests, suppositions, etc., depending on how the event or state is viewed; it also distinguishes negation from affirmation, non-continuing from continuing operations, and non-current from current states and events.

The proposition consists of related basal constituents and their respective roles. The relations of these basals in the proposition are defined by their respective roles. Basals may also be related within subconstructs, which take roles as constituents of propositions in the larger constructs.

Roles that may occur in constructs encoding states include attribute, classification, nomination, and possessor. These roles accompany basals underlying words referring respectively to qualities, classes, names, and "owners" of things (animate, inanimate, and abstract entities are included in things). The object role, which is semantically neutral, occurs in constructs encoding non-ambient states and may also occur in constructs encoding events.

Constructs encoding events may have as central role either process or action. The process role is associated with change of state and the action role with activity. A separate designation is needed for the role associated with activity that results in a change of state; for want of a better term, affect is used to designate that role. The patient role is associated with something that undergoes a change of state and the agent role with the initiator of activity. The instrument role accompanies basals underlying words referring to the means by which something is done. Roles of time and location are associated with words and phrases indicating temporal and spatial orientation.

Some of the roles listed above may occur either with basals or with subconstructs. Additional roles associated primarily with subconstructs are cause, condition, and degree. The list of roles is obviously incomplete, and both the names and the descriptions may require revision. Nevertheless, the incomplete list provides a means of accounting for the semantic structures

underlying a variety of sentences. The following outline is illustrative:

I. A semantic construct may encode a state or an event.

A. A state may consist of:
1. attribute and object (The ball is pretty);
2. classification and object (The ball is a toy);
3. nomination and object (That is a ball);
4. possessor and object (The ball is Pat's).

B. An event may consist of:
1. process and patient (The baby grew);
2. action and agent (The baby walked);
3. affect, patient, and agent (Mother bathed the baby); instrument (with a cloth), location (in the kitchen) and time (this morning) may also be included.

II. A semantic subconstruct has a role which defines its relation to the larger construct of which it is a part (e.g., the role of condition accompanies the subconstruct underlying if he could in "The baby would walk if he could").

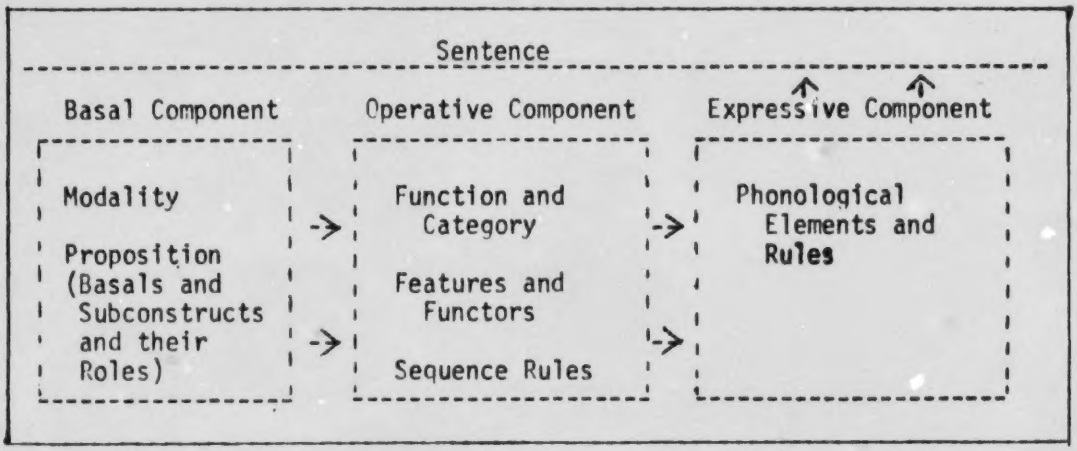
An adequate list of roles would permit formulation of a set of generative rules. Such rules might take the following form:

1. Construct --> Modality + Proposition
2. Proposition --> {State / Event}
3. State --> {Attribute / Classification / Nomination / Possessor} + Object
4. Event --> {Process + Patient / Action + Agent / Affect + Patient + Agent}

The operative component is divided into subcomponents, one of which assigns grammatical functions (subject, predicator, direct object, etc.) to basal constituents and categorizes them as nouns, verbs, adjectives, or adverbs. A second subcomponent supplies syntactic features and functors. Rules determining sequential position of elements in overt structure also belong to the operative component.

The expressive component consists primarily of phonological elements and rules, but it is viewed broadly enough to include graphic and other forms of linguistic expression. Since this essay is primarily concerned with semantic and syntactic structure, no attempt is made here to deal with the expression component in detail.

The relationships of the components to one another and to the overt sentence are illustrated in the diagram below.



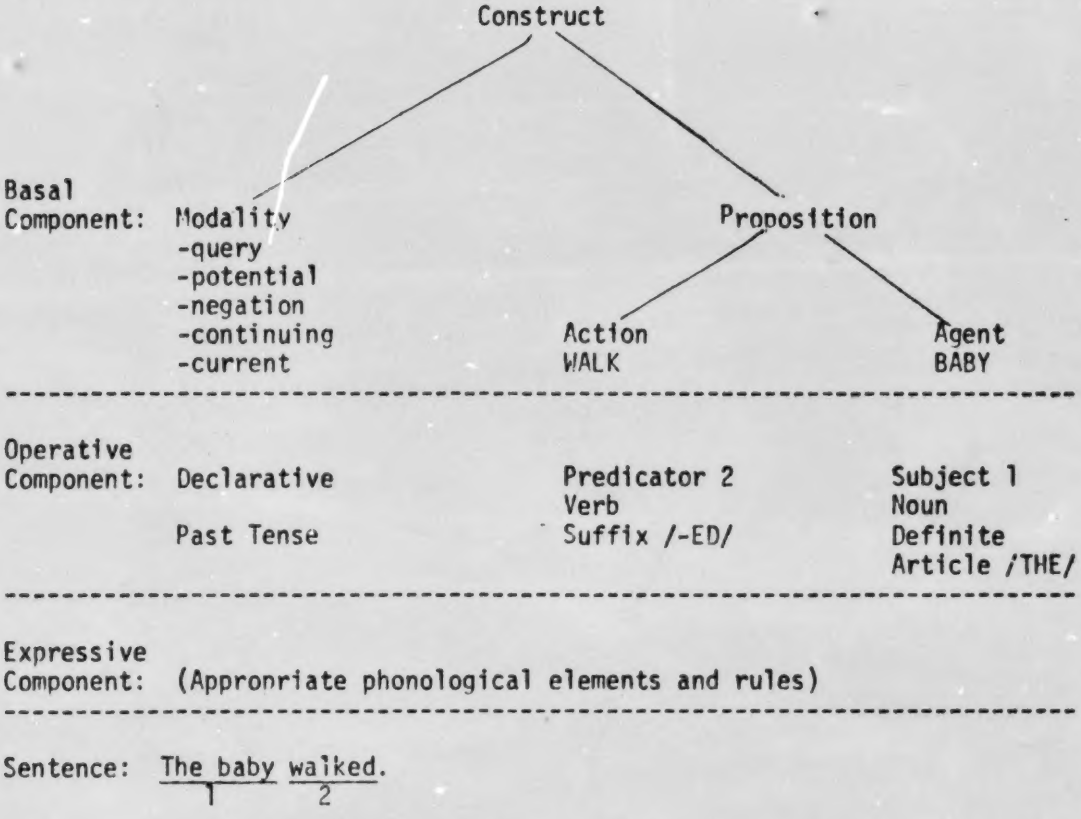
A practical problem arises from the need for unique symbols to represent basal constituents in explanatory diagrams. Of all available alternatives, the least objectionable seems to be a system of alphabetic representation modified to distinguish symbols for basals from symbols for overtly expressed words. Thus, the basal constituents underlying words will be represented by upper case letters in diagrams showing sentence derivations. Illustrative examples are given in the following paragraphs.

The construct underlying "The baby walked" encodes an event rather than a state. The modality index indicates that the event is viewed as actual rather than potential, an assertion rather than a query, an

affirmation rather than a negation; and that it is not current nor continuing. The proposition is made up of two basal constituents and their roles: WALK, with action role, and BABY, with agent role.

In the operative component, WALK is assigned predicator function and position 2 in sequential order. It is categorized as a verb and the past tense suffix -ED is supplied. BABY is assigned subject function, with position 1 in sequential order. It is categorized as a noun and is accompanied by the definite article THE. Appropriate phonological elements and rules are added in the expressive component to produce the overt sentence.

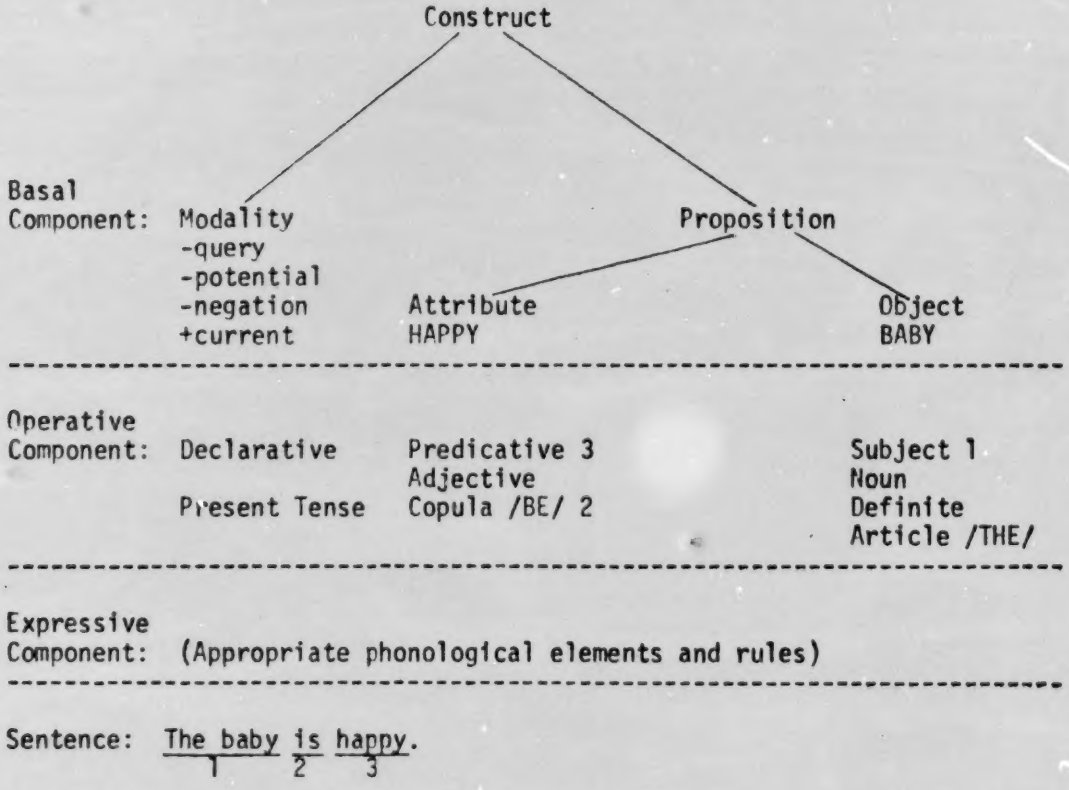
The derivation of "The baby walked" is represented in part in the following diagram:



The sentence "Is the baby walking?" has the same basal constituents

and roles as "The baby walked." The differences between the two sentences are accounted for in the modality index and in the operative component. The modality index for "Is the baby walking?" indicates query of a current and continuing event. The operative component indicates an interrogative sentence with progressive aspect and present tense. It also supplies the suffix -ING and the auxiliary BE. The auxiliary is given position 1 in sequential order and the verb is given position 3.

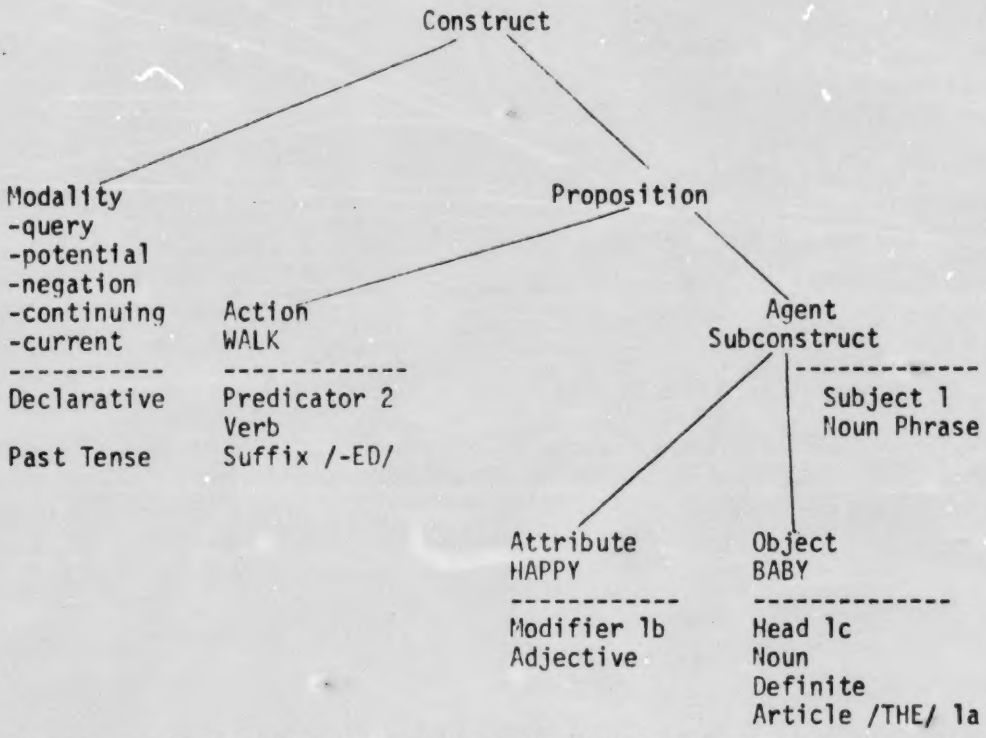
The following diagram represents the derivation of "The baby is happy."



The construct encodes a state rather than an event, and the state is perceived as current. The proposition has two basals: BABY with the semantically neutral role of object, and HAPPY with attribute role. HAPPY

is categorized as adjective, with predicative function. The predicator function is served by the copula BE.

The sentence "The happy baby walked" results from a construct whose proposition includes a subconstruct. The derivation is represented in the following diagram (component labels are omitted in order to save space).



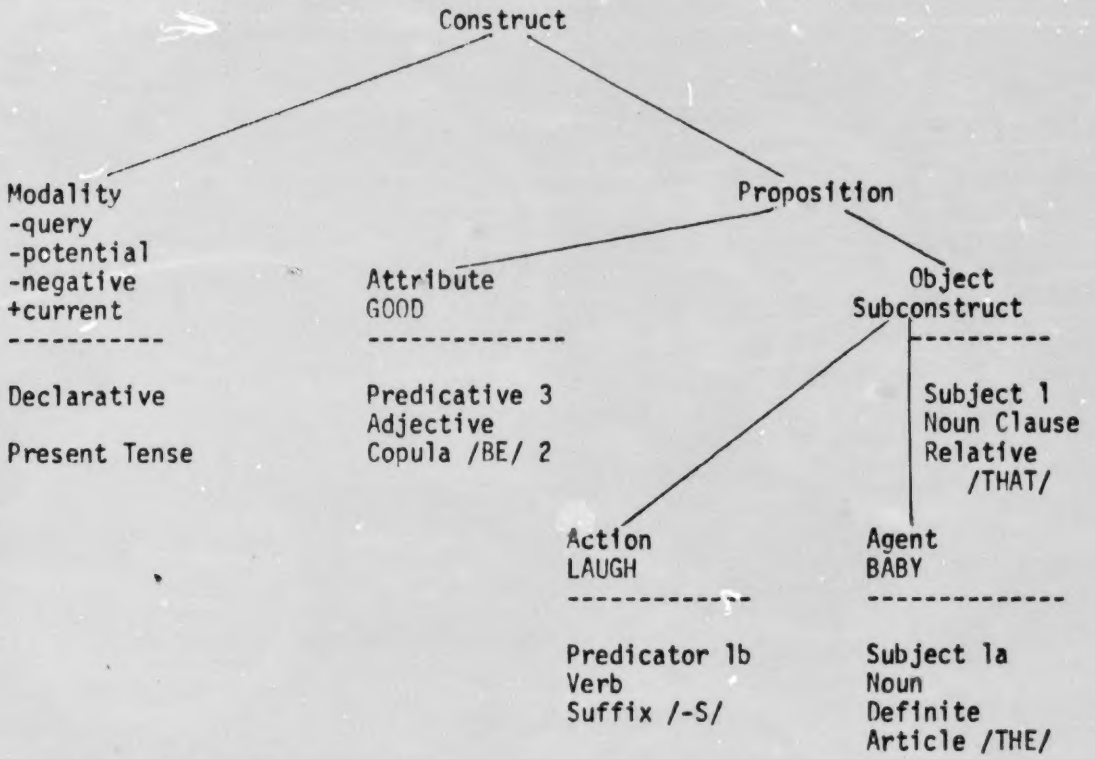
Sentence: The happy baby walked.
1 2

The subconstruct has two basal constituents: BABY, with object role, and HAPPY, with attribute role. HAPPY is categorized as an adjective with modifier function, and BABY is categorized as a noun with head function. Together they make up a structure categorized as a noun phrase with subject

function. The sequence of elements in the noun phrase is indicated by the letters a, b, and c.

Similarly, other syntactic structures such as subordinate clauses and participle phrases would be derived from constructs containing subconstructs. Each subconstruct would have its own role in basal structure; its function, category, and sequential position would be determined by the operative component.

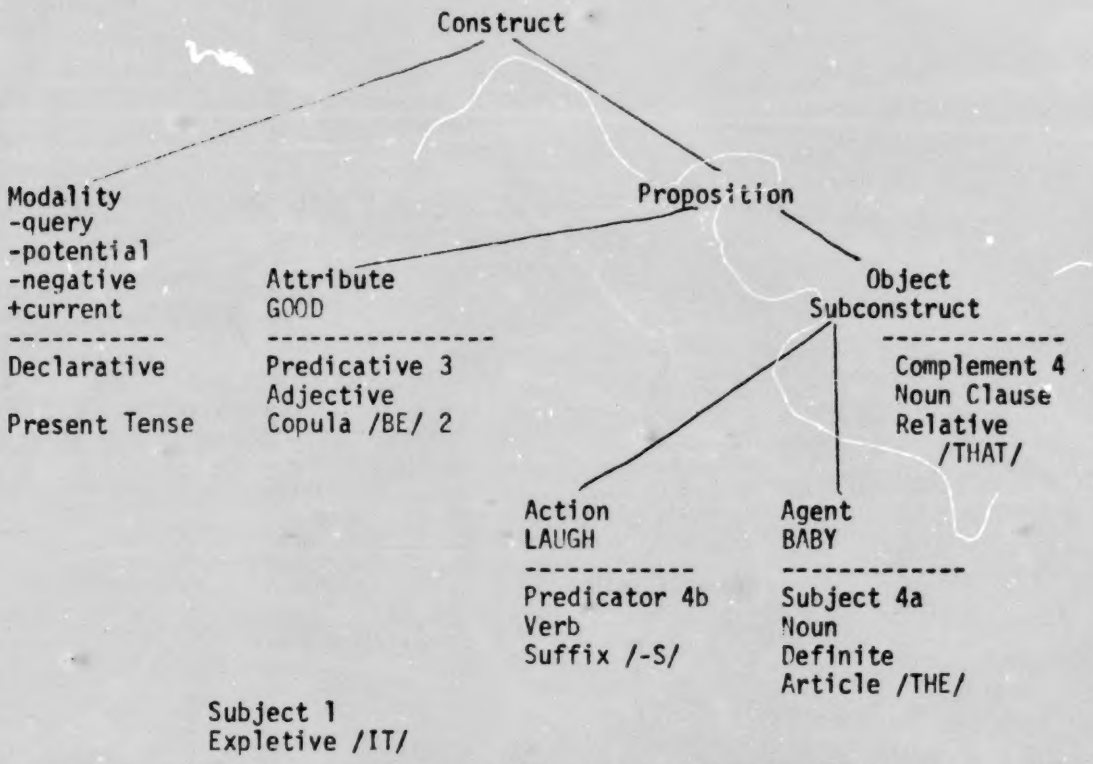
Differences between "It is good that the baby laughs" and "That the baby laughs is good" are accounted for in the operative component. "That the baby laughs is good" is derived as follows:



Sentence: That the baby laughs is good.
1 2 3

BABY and LAUGH combine in a subconstruct with object role. The resulting noun clause, introduced by the relative functor THAT, functions as subject of the overt sentence.

"It is good that the baby laughs" has the same basal component as "That the baby laughs is good." The different operative component is illustrated below.



Sentence: $\underset{1}{\text{It}}\ \underset{2}{\text{is}}\ \underset{3}{\text{good}}\ \underbrace{\text{that the baby laughs}}_{4}$.

The expletive IT, which functions as subject of the overt sentence, has no equivalent in the basal component and is therefore represented as originating in the operative component. That the baby laughs is a noun

clause functioning as complement of the predicative adjective and is assigned position 4 in the overt sentence.

Part III

APPLICATIONS IN TEACHING AND RESEARCH

The proposed modifications in linguistic theory have numerous implications for research in language-related areas. The proposed division into basal, operative, and expressive components allows a clear focus on semantic structure, and recognition of role as a semantic unit permits precision in analysis of semantic constructs.

The fact that the same construct can take different overt forms accounts for the possibility of stylistic diversity in language. Sometimes the overt differences result from optional rules governing sequential order of elements, sometimes from optional insertion of functors, sometimes from optional suppression of basals, etc. Conversely, the fact that different constructs can sometimes take identical overt forms accounts for the possibility of structural ambiguity in language. Thus, the distinction between constructs and sentences has implications for some of the practical problems that arise in teaching language.

Since the ability to perceive events and states and to encode them in semantic constructs is universally shared by language users, the basal component of language cannot be regarded as language specific. The semantic elements implicit in modality and in the basal constituents and their roles may be assumed to vary little, if any, from one language to another. The grammatical features and functors derived from the operative component and the phonological elements and rules from the expressive component account for most of the differences among languages, as well as differences among different dialects of the same language. The possibility of describing a basal component common to all natural languages has implications for research

in teaching and learning second languages and dialects. It also has implications for research in the feasibility of using computers in language translation.

In a fundamental sense, sentences are viewed as linguistic output; but once uttered, they become events in perceptual and cognitive experience. Thus, it is possible that a language may be influenced by feedback from its own overt forms. If the environment in which a specific language evolves either encourages or discourages the perception and cognitive processing of certain kinds of phenomena, the capacity of that language to deal efficiently with such phenomena may be altered accordingly. To some extent, a language both shapes and is shaped by the experiences of its users.

In the normal course of language acquisition and development, the child begins with great potential but limited experience and skill. Since the child's perceptual and cognitive ability is restricted by maturational level, the ability to form constructs must be similarly restricted. Likewise, the ability to use the operative and expressive resources of language is severely restricted at the initial stages of language development. Apparently, the child's early utterances are essentially restricted constructs with a minimum of the necessary phonological elements and almost no operative elements.

Individual differences in language may be accounted for in part by differences in experience and in part by differences in perceptual and cognitive capacity. Individual deficiencies in ability to perceive related parts of events and states, regardless of the origins of those deficiencies, would necessarily lead to limited ability to encode those events and states in semantic constructs. Individuals may also differ, for various reasons,

in the degree to which they develop mastery of the operative and expressive resources of their language.

Since linguistic comprehension apparently involves a process which is the reverse of linguistic expression, the proposed modifications in linguistic theory have implications for research in listening and reading comprehension. In speaking or writing, perceived events and states are encoded in constructs which are given syntactic and phonological or graphic features in the operative and expressive components. In listening or reading, overt structures must be perceived and decoded. This decoding occurs at three levels, corresponding to the expressive, operative, and basal components of language. At the expressive level combinations of phonological or graphic symbols are perceived by the listener/reader. At the operative level cues of syntactic structure are perceived. At the basal level the semantic features and relationships of constituents in constructs are perceived. To the extent that the decoded construct matches the construct encoded by the speaker/writer, comprehension has occurred.

Although the proposed modifications of linguistic theory are tentative and incomplete, their further refinement should result in a system which will be widely applicable in teaching and in research in applied linguistics.

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